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Attorney Docket No. P27286

In re application of: Y. UMEHARA

Application No. : 09/695,874

**Mail Stop Amendment**

Group Art Unit : 3683

Filed : October 26, 2000

Examiner : Burch, M. M.

For : CALIPER BODY AND METHOD OF MANUFACTURING CALIPER BODY OF  
 VEHICULAR DISC BRAKE

**Mail Stop Amendment**

Commissioner for Patents  
 U.S. Patent and Trademark Office  
 Customer Service Window, Mail Stop Amendment  
 Randolph Building  
 401 Dulany Street  
 Alexandria, VA 22314  
 Sir:

Transmitted herewith is an **Appeal Brief under 37 C.F.R. 41.37(a)** in the above-captioned application.

☐ Small Entity Status of this application under 37 C.F.R. 1.9 and 1.27 has been established by a previously filed statement.

☐ A verified statement to establish small entity status under 37 C.F.R. 1.9 and 1.27 is enclosed.

☐ An Information Disclosure Statement, PTO Form 1449, and references cited.

☐ A Request for Extension of Time.

☐ No additional fee is required.

The fee has been calculated as shown below:

Claims After Amendment	No. Claims Previously Paid For	Present Extra	Small Entity		Other Than A Small Entity	
			Rate	Fee	Rate	Fee
Total Claims: 21	*23	0	x25=	\$	x 50=	\$0.00
Indep. Claims: 3	**4	0	x100=	\$	x200=	\$0.00
Multiple Dependent Claims Presented			+180=	\$	+360=	\$0.00
Appeal Fee				\$		\$500.00
* If less than 20, write 20			Total:			
** If less than 3, write 3					Total:	\$500.00

☐ Please charge my Deposit Account No. 19-0089 in the amount of \$\_\_\_\_\_.

☒ A check in the amount of \$500.00 to cover the filing fee is included.

☒ The U.S. Patent and Trademark Office is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 19-0089.

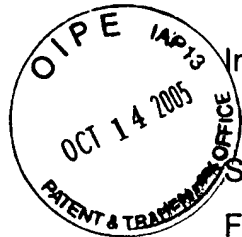
☒ Any additional filing fees required under 37 C.F.R. 1.16.

☒ Any patent application processing fees under 37 C.F.R. 1.17, including any required extension of time fees in any concurrent or future reply requiring a petition for extension of time for its timely submission (37 C.F.R. 1.136(a)(3)).

Andrew M. Calderon  
 Reg. No. 38,093

Serial No.: 09/695,874

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**



In re patent application of

Docket No. P27286

Yoshiaki Umehara

Serial No.: 09/695,874

Group Art Unit: No. 3683

Filed: October 26, 2000

Examiner: Burch, Melody M.

For: **CALIPER BODY AND METHOD OF MANUFACTURING CALIPER  
BODY OF VEHICULAR DISC BRAKE**

**APPEAL BRIEF UNDER 37 C.F.R. § 41.37(a)**

Sir:

Appellants have filed a timely Notice of Appeal and Pre-Appeal Brief Request from the Final Office Action, on July 22, 2005. A single copy of this brief is provided pursuant to 35 U.S.C. § 41.37(a).

Appellants are timely filing this Appeal Brief, e.g., by one month of the mailing of the Notice of Panel Decision from Pre-Appeal Brief Review. If extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. §1.136(a), and any fees required therefor (including fees for net addition of claims) are hereby authorized to be charged to Deposit Account No. 19-0089.

**REAL PARTY IN INTEREST**

The real party in interest in this appeal is Nissin Kogyo Co., LTD., assignee of the entire interest in the above-identified application.

**RELATED APPEALS AND INTERFERENCES**

The Appellants, their legal representatives and the Assignee are not currently aware of any appeal that may directly affect or be indirectly affected by

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or have some bearing on the Board's decision in this appeal. Attached hereto is a Related Proceedings Appendix showing no related appeals or interferences.

### **STATUS OF THE CLAIMS**

Claims 6-11, 13-16 and 18-28 are currently pending and rejected.

The claims in issue are attached in the "Claims Appendix" attached herewith.

### **STATUS OF AMENDMENTS**

All prior amendments to the application have been entered.

### **SUMMARY OF CLAIMED SUBJECT MATTER**

#### ***Independent Claims 6, 15 and 19***

The invention recited by claims 6, 15 and 19 are directed to a caliper body of a vehicular disc brake made by a casting method. The disc brake has a pair of frictional pads disposed opposite each other with a disc rotor held therebetween (See, Fig. 4 and page 12, lines 1-12). The caliper body includes a cylinder disposed on one side of the disc rotor, a reaction pawl disposed on the other side of the disc rotor, and a bridge for coupling the cylinder and the reaction pawl at the outer peripheral side of the disc rotor. (See, Fig. 4 and page 11, lines 1-3.)

In the invention recited in claims 6 and 19, the sprue is formed at the bottom portion of the cylinder of the caliper body for molding the caliper body with a base material. (See, Fig. 5 and page 12, lines 1-12 and page 13, lines 19-21.) The caliper body is molded with a cavity disposed with a union hole formed from the sprue (emphasis added) (see, page 13, lines 17-19 and page 14, lines 16-20), while the side of molding the bottom portion of the cylinder is disposed in a vertically upper part of the cavity and also the side of molding the reaction pawl is disposed in a vertically lower part of the cavity. (See, Fig. 5 and page 13.) In the

invention of claim 19, a flange portion of the union hole is formed by processing the sprue after the casting. (See, Fig. 5 and page 14, lines 16-20.)

One side of providing the cylinder is an action chamber and another side of molding the reaction pawl and the bridge is a reaction chamber. (See, Fig. 1 and page 11, lines 13-25 and page 12.) There is a thick-walled connection between the cylinder and the bridge which is made a central chamber. (See, Fig. 1 and page 11, lines 13-25 and page 12). As recited in claims 6, 15 and 19, the ratio of volume of the central chamber to that of the reaction chamber is in the range of 0.6 to 1.25. (See, Figs. 7-10, Tables 1 and 2 at page 17, and discussion at pages 8 and 8-22, with emphasis on page 8 and page 20, lines 18-25.) The ratio of volume of the central chamber to that of the action chamber is in the range of 0.7 to 1.35. (See, Figs. 7-10, Tables 1 and 2 at page 17, and discussion at pages 18-22, with emphasis on page 8, page 21, lines 18-25, page 22, lines 5-15 and page 22, line 16 to page 23, line 20.)

## **GROUND OF REJECTION TO BE**

### **REVIEWED ON APPEAL**

1. Claims 6-11, 13-16, 19 and 23-28 are rejected under 35 U.S.C. §103(a) for being unpatentable over JP-835530 in view of U.S. Patent No. 4,705,093 to Ogino and JP-1146718.

2. Claims 18 and 20-22 are rejected under 35 U.S.C. §103(a) over JP-835530 in view of U.S. Patent No. 4,705,093 to Ogino and JP-1146718 as applied to claims 6 and 7 and further in view of WIPO 98/27353.

## ARGUMENT

### ***REJECTION UNDER 35 U.S.C. 103(a)***

#### ***CLAIMS 6-11, 13-16, 19 AND 23-28***

##### ***Claims 6-11, 13, 14, 23-25 and 28***

Appellants appeal this rejection, which is premised on the Examiner's argument that the claimed system is indistinguishable from the system described by JP-835530 in view of U.S. Patent No. 4,705,093 to Ogino and JP-1146718. Appellants respectfully traverse the Examiner's arguments and submit that the various features in the claims are distinct from that disclosed by the applied references.

The invention is directed to a caliper body of a vehicular disc brake made by a gravity die casting method. The disk brake has a sprue formed at the bottom portion of the cylinder of the caliper body for molding the caliper body with a base material. In fact, the caliper body is molded with a cavity disposed with a union hole formed from the sprue. This feature is simply not shown in any of the references of record. Additionally, the claimed invention recites that

1. ratio of volume of the central chamber to that of the reaction chamber is in the range of 0.6 to 1.25; and
2. the ratio of volume of the central chamber to that of the action chamber is in the range of 0.7 to 1.35 (see, Figs. 7-10, Tables 1 and 2 at page 17, and discussion at pages 18-22, with emphasis on page 8, page 21, lines 18-25, page 22, lines 5-15 and page 22, line 16 to page 23, line 20).

These ratios after exhaustive testing, were proven to eliminate sink marks as discussed at pages 20 and 21, for example, of the present specification. In addition, the ratios ensure that the solidification starts from the reaction portion where the molten metal first enters after the injection of the molten material, and

then progresses toward the central portion where the solidification is slower, i.e., directional solidification. However, the applied references also do not show these features.

In order to reject a claim under 35 U.S.C. §103(a), MPEP 2143, states, in part:

"To establish a *prima facie* case of obviousness,... there must be some suggestion or motivation, either in the references themselves or in knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings.... Finally, the prior art reference (or references when combined) must teach or suggest all of the claimed limitations."

However, the Examiner has not met this burden.

The Examiner argues at page 2 of the office action dated March 1, 2005 that JP-835530 shows:

... the caliper body comprising: a union hole shown surrounding element number 5 formed at the bottom portion of the cylinder of the caliper body capable of being used as a sprue for molding the caliper body with a base material and a cavity shown in the area of element number 4 disposed with the union hole....

This simply is not true.

Appellants submit that there is no suggestion that the inlet 5 of JP8-35530 is used as a sprue for injecting molten material into a cavity for forming the brake. This would be pure conjecture on the part of the Examiner and Appellants submit impermissible hindsight reasoning. JP8-35530 only discloses and suggests that the inlet 5 is used for working fluid for the caliper, itself. (See, abstract.) Appellants further argue that since there is no suggestion that the inlet 5 is used as a sprue, it then follows that, for example, JP 8-35530 does not show or even remotely suggest that

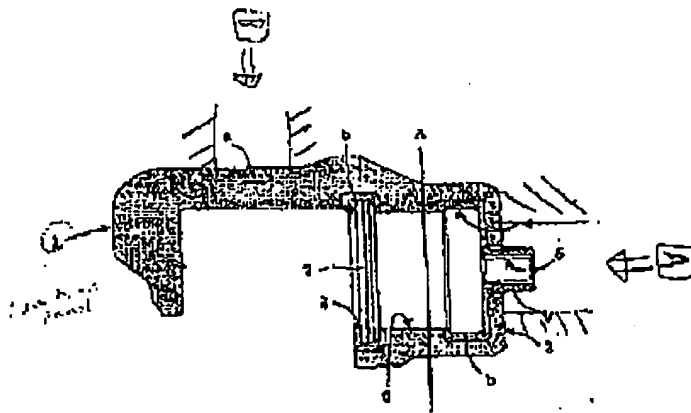
the caliper body is molded .... while the side of molding said bottom portion of said cylinder is disposed in a vertically upper part of said cavity and also the side of molding said reaction pawl is disposed in a vertically lower part of said cavity.

Appellants further submit that the advantages achieved by JP8-35530 are provided by the use of different materials (a) and (b). It is the use of these materials in which a cutting performance and abrasion resistance with high rigidity is achieved. It is not through the same molding characteristics of the present invention. In fact, it is suggested that the use of the different materials (a) and (b) would teach away from using the inlet as a sprue simply because the sprue is made from material (b) as with other sections, while other portions are made with material (a). The use of the opening as the sprue cannot be used for such a configuration. Instead, a different type of casting method would be used which may not result in the high yield of the present invention, elimination of sink marks and the high rigidity.

Also, the declaration under 37 CFR §1.132, dated May 25, 2004, signed by expert, Keisuke Ban, declares that JP-835530 does not show a sprue that is used to form a union hole, e.g., a union hole formed from the sprue. JP-835530 also cannot be modified to show such feature. In the declaration of Mr. Ban dated May 25, 2004, Mr. Ban declared:

It is my expert opinion that one of ordinary skill in the art would recognize that JP8-35530 does not show that a flange portion of the union hole is formed by processing the sprue after the casting. As JP8-35530 should be understood, it is simply impossible to use the inlet hole 5 of JP8-35530 as a sprue. In the case where the inlet hole 5 is utilized as a sprue and a molten metal is provided from the direction A..., the hole 5 would be closed. In order to prevent the hole from being closed, the molten metal must be provided from the B-direction at a place other than the hole 5. It would be impossible for the hole to be used as a sprue. (Emphasis added.)

As shown in the figure reproduced below, in JP-835530, where the inlet hole 5 is utilized as a sprue and a molten metal is provided from the direction A (as shown below in the figure reproduced), the hole 5 would be closed. In order to prevent the hole 5 from being closed, the molten metal must be provided from the B-direction at a place other than the hole 5. It would then be impossible for the hole to be used as a sprue.



Additionally, Appellants submit that the declaration of Mr. Ban was not given proper deference in accordance with MPEP 716.01(c) III, *In re Beattie*, 974 F.2d 1309, 24 USPQ2d 1040 (Fed. Cir. 1992)). By way of example, the Examiner does not provide any credible evidence to show that JP-835530 should or could be interpreted any differently than the interpretation provided by Mr. Ban, an expert in the field. In fact, the Examiner first accepted this declaration, as clearly seen in the office action dated October 19, 2004, i.e., by the fact that the Examiner had withdrawn all substantive rejections based on prior art in response to the filing of the declaration. However, in presenting this same rejection, again, the Examiner merely reiterates the same arguments of March 2, 2004, despite credible evidence to the contrary. Simply, the hole 5 of JP-835530 cannot be used as a sprue and there is no credible evidence to the contrary.

The Examiner admits that JP-835530 does not show gravity casting methods of the claimed invention; however, the Examiner argues that the Ogino reference can be used to modify JP-835530 to include gravity casting methods



resulting in the claimed invention. However, Appellants submit that the combination of JP-835530 and Ogino is flawed and that there would be no reasonable expectation of success using the combination presented by the Examiner, and that one of ordinary skill in the art would not have been motivated to combine these references in order to achieve the claimed invention. Additionally, the combination of references does not show all of the features of the claimed invention.

In particular, Appellants direct the Board's attention to the arguments set forth on page 10, 3<sup>rd</sup> paragraph to page 11, line 2, of the amendment filed on July 8, 2003. More specifically, a caliper body of the present invention is utilized in disc brake systems. It is thus necessary that both the reaction pawl and the cylinder have a rigidity that can resist against a hydraulic pressure because such hydraulic pressure for operating the brake system is generated inside of the cylinder. Further, the reaction pawl must have a rigidity that can press a friction pad disposed on the reaction pawl side towards a disc rotor with its reaction force corresponding to an operating force of the cylinder side.

Appellants contend, though, that a gravity casting method would not be able to form interspersed materials (a) and (b) (see Figures 2 and 3 of JP8-35530), in addition to the material (b) for the seal 3, bottom part 4 and inlet 5. That is, one of ordinary skill in the art would not be able to use a gravity casting method to form all of the features of JP8-35530. Instead, it would appear that the JP8-35530 would use a high pressure or press fit method in order to form the different components of at least the seal 3, bottom part 4 and the inlet 5 of the light metal matrix (b). Of course, then, the combination of JP8-35530 and Ogino would not result in the claimed invention. Simply, the gravity casting method used with JP8-35530 would not result in a caliper body having a uniform base material as a whole; instead, if used, *arguendo*, it would result in a caliper body with the interspersed materials (a) and (b) and material (b) in the seal 3, bottom part 4 and the inlet 5.

Appellants further submit that JP 8-35530 shows important differences which, in combination with Ogino, would not result in the claimed invention. In particular, JP8-35530 discloses a brake caliper made from two materials (a) and (b). The brake caliper is equipped with a cylinder 2 and a yoke 1 which are made of light metal based composite material (a) with reinforcing components dispersed in the light metal materials. Light metal matrix parts, denoted as (b), are formed in a strip in the axial direction and are dividedly in the circumferential direction. Also, the seal 3, bottom part 4 and the inlet 5 are formed from the light metal matrix (b). Figures 2 and 3 of Ogino show the specific areas of the light metal matrix (b) and the light metal based composite material (a). The components 3, 4 and 5 are inserted into a cavity for die casting and then die cast with material (a).

Additionally, Ogino does not mention the orientation of the mold during casting and certainly does not disclose or remotely suggest a method of casting which can accomplish the end product of a sprue being used for a union hole. This is despite the Examiner's argument to the contrary on page 3 of the office action dated March 1, 2005. Thus, even if one were to combine the Ogino reference with JP8-35530, there is still no teaching of the use of a union hole formed from a sprue, nor would one look to the these references in order to orient the mold in such a manner as to result in the claimed invention.

The Examiner further argues that JP-1146718 teaches optimal value ratios to achieve little or no sink holes, and that this reference can be combined with that of JP-835530 and Ogino. Appellants submit that JP-1146718 does not even show the ratios of the claimed invention, a critical flaw in the Examiner's rejection. For example, JP-H1-146718 refers to volume ratios, in general, of the mold opening and the like. It does not address any specific ratios, as recited in the claimed invention (which provides many advantages), and it also does not even address the same portions of the mold which are used by the claimed invention.

Appellants submit that the claimed specific ratios provide a great advantage over prior art systems, e.g., with the use of the materials disclosed and recited, the brake caliper can be properly fitted to the wheel without having the bridge interfering with the wheel, while also ensuring proper strength and rigidity of the action portion. In conventional systems using casting methods, this ratio has never been contemplated since the materials used, e.g., have different properties such as rigidity and strength. Also, the supply of the molten material from the central portion where the solidification is slow can be continued due to the step by step supply effect based on the ratio of volume. This contributes to the elimination or prevention of any sink marks produced in the reaction portion and the caliper body. This was not contemplated in prior systems. These features simply are not shown by the applied references.

Appellants additionally submit that

Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. (*ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577 (Fed. Cir. 1984).)

Further, MPEP §2141.01(a) states that to rely on a reference under 35 U.S.C. §103, it must be analogous prior art.

To this end, Appellants submit that JP-H1-146718 does not teach or is even remotely related to caliper brakes or a material used for caliper brakes. Thus, this reference does not provide any motivation to combine JP-H1-146718 with any of the remaining references. In fact, the JP-H1-146718 would clearly fall into the nonanalogous art category. That is, this reference is not even reasonably pertinent to the particular problem with which the inventor was involved, e.g., molding of caliper brakes, nor does this reference relate to any other applied reference.

For example, JP-H1-146718 is directed to injection molding processes of resins, a material that would not be used for casting a caliper body of a vehicular disc brake. Much different considerations are taken into account using these two very different molding methods (e.g., die casting and injection molding). For example, resins behave much differently than metals during molding processes. Also, in injection molding, there are many different methods used, none of which are used in metal casting, e.g., (i) high or low pressure gas assist injection molding or (iii) high or low pressure foam injection molding, all of which provide different features. As an illustration, gas assisted pressure molding results in a hollow structure, whereas, foam injection molding results in a product with small gas bubbles therein. These techniques and the end results are contrary to that of gravity casting of products, as claimed.

To further show that JP-H1-146718 is non-analogous art, referring to the Abstract of JP-H1-146718, this reference teaches storing data on compression pressure and variations of volume due to cooling temperature on a storage medium for injection compression processes (for plastic). Injection compression processes are used for plastics and resins, not for parts such as a caliper body of a vehicular disc brake. For this, Appellants direct the Examiner's attention to the Abstract which recites in part:

P-v-t diagram (pressure-volume-temperature relative diagram) of each resin is stored in a floppy disc or an optical disc and the mold compressing conditions such as the cavity volume of the mold product, injection dwell pressure, mold compression pressure, cooling temperature, volume ratio of mold opening and the like are plotted on the diagrams, which are displayed on the screen (CRT). (Emphasis added.)

This reference is thus directed to injection molding processes of resins and other types of plastic; that is, JP-H1-146718 would be used exclusively for resins or plastics. A compression injection molding process is not used for caliper brakes of a vehicle. It would thus not have been obvious to one of

ordinary skill in the art to use this reference, in combination with the other references, to make such a combination in order to achieve the claimed invention. Said otherwise, there would be no motivation to make such a combination of reference JP-H1-146718 with the other references since JP8-35530 is directed to such a disparate art, nonanalogous, and lacks any teaching or suggestion to make any such combination (as suggested by the Examiner). In this case, simply, it is Appellants' opinion that the Examiner cannot point to something in the prior art that suggests in some way a modification of a particular reference or combination with JP-H1-146718 in order to arrive at the claimed invention.

Also, the Examiner merely notes that it would have been obvious to have the recited ratios provided by JP-1146718, without showing any specific motivation. In fact, the Examiner merely concludes at page 3 of the office action dated March 1, 2005, that the use of the ratios would be known to those of ordinary skill in the art. This is pure hindsight reasoning, which is impermissible. First, there is no suggestion, whatsoever, in the JP-1146718 reference to show these ratios. Second, the only way one of skill in the art would have known to use these ratios would have been to read the instant disclosure of the present invention. Simply, there is no other way to have known this, but for reading the disclosure. Third, it was only after extensive experimentation using the molding of the invention that these ratios were found to be advantageous by the inventors.

In additional, Mr. Ban rebutted the use of JP-1146718, by declaring:

JP-H1-146718 would be used exclusively for resins for plastics. This would not be related to nor could it be modified for the use of casting automotive braking systems, for example. Said otherwise, this reference is directed to injection molding processes of resins, a material that would not be used for casting a caliper body of a vehicular disc brake. By way of illustration, the Abstract of JP-H1-146718 clearly teaches storing data on compression pressure and

variations due to cooling temperature on a storage medium  
for injection compression processes for resins and plastics.

However, despite this expert opinion of Mr. Ban, the Examiner still maintains that it would be obvious to use the ratios of JP-1146718 to achieve the claimed invention, without providing clear rebuttal evidence to Mr. Ban's declaration. Also, the declaration of Mr. Ban was not given proper deference in accordance with MPEP 716.01(c) III, *In re Beattie*, 974 F.2d 1309, 24 USPQ2d 1040 (Fed. Cir. 1992)). In fact, the Examiner already allowed this feature in the March 2, 2004 and October 19, 2004 office actions, but now reverts back to this rejection without providing any additional reasons for rejection.

Additionally, the ratios recited by the claimed invention are not mere obvious design choices. It was with extensive experimentation, with results that were unexpected, that the inventors have concluded that such ratios are optimal for the invention. These ratios were proven, after exhaustive testing, to eliminate sink marks, and assist considerably in the proper flow and directional solidification of the molten through the complex part, as discussed on pages 20 and 21 of the disclosure.

Claims 15 and 16

Claim 15 recites, in part,

a sprue formed at the bottom portion,

...

the ratio of volume of the central chamber to that of  
the reaction chamber is in the range of 0.6 to 1.25, and

the ratio of volume of the central chamber to that of  
the action chamber is in the range of 0.7 to 1.35.

As noted above, these ratios after exhaustive testing, were proven to eliminate sink marks as discussed at pages 20 and 21, for example, of the present specification. In addition, the ratios ensure that the solidification starts from the reaction portion where the molten metal first enters after the injection of

the molten material, and then progresses toward the central portion where the solidification is slower, i.e., directional solidification.

JP-H1-146718 does not teach or is even remotely related to caliper brakes or a material used for caliper brakes. This reference does not provide any motivation to combine JP-H1-146718 with any of the remaining references. JP-H1-146718 would clearly fall into the nonanalogous art category. For example, JP-H1-146718 is directed to injection molding processes of resins, a material that would not be used for casting a caliper body of a vehicular disc brake. As previously discussed above, much different considerations are taken into account using gravity casting methods using alloy and injection molding techniques using resins.

Appellants further submit that JP-H1-146718 does not even show the same ratios as provided in the claimed invention. For example, JP-H1-146718 refers to volume ratios, in general, of the mold opening and the like. It does not address any specific ratios, as recited in the claimed invention, and it also does not even address the same portions of the mold which are used by the claimed invention.

Also, the Examiner merely notes that it would have been obvious to have the recited ratios provided by JP-1146718, without showing any specific motivation. In fact, the Examiner merely concludes at page 3 of the office action dated March 1, 2005, that the use of the ratios would be known to those of ordinary skill in the art. This is pure hindsight reasoning, which is impermissible, as discussed above. There is simply no suggestion, whatsoever, in the JP-1146718 reference to show these ratios and one would only know these ratios by reading the instant disclosure.

In additional, in the declaration of Mr. Ban, Mr. Ban rebutted the use of JP-1146718 by declaring:

JP-H1-146718 would be used exclusively for resins for plastics.  
This would not be related to nor could it be modified for the use of

casting automotive braking systems, for example. Said otherwise, this reference is directed to injection molding processes of resins, a material that would not be used for casting a caliper body of a vehicular disc brake. By way of illustration, the Abstract of JP-H1-146718 clearly teaches storing data on compression pressure and variations due to cooling temperature on a storage medium for injection compression processes for resins and plastics.

However, despite this expert opinion of Mr. Ban, the Examiner still maintains that it would be obvious to use the ratios of JP-1146718 to achieve the claimed invention, without providing clear rebuttal evidence to Mr. Ban's declaration. Also, the declaration of Mr. Ban was not given proper deference in accordance with MPEP 716.01(c) III, *In re Beattie*, 974 F.2d 1309, 24 USPQ2d 1040 (Fed. Cir. 1992)). In fact, the Examiner already allowed this feature in the March 2, 2004 and October 19, 2004 office actions, but now reverts back to this rejection without providing any additional reasons for rejection.

Additionally, the ratios recited by the claimed invention are not mere obvious design choices. It was with extensive experimentation, with results that were unexpected, that the inventors have concluded that such ratios are optimal for the invention. These ratios were proven, after exhaustive testing, to eliminate sink marks, as discussed on pages 20 and 21 of the disclosure.

#### Claim 19

Claim 19 recites, in part,

....wherein a flange portion of the union hole is formed by processing the sprue after the casting,...

However, this feature is not shown in any of the references, either alone or in combination.

For example, there is no suggestion in JP8-35530 that a flange portion of the union hole is formed by processing the sprue after the casting. Also, as discussed above, in the declaration of Mr. Ban dated May 25, 2004, Mr. Ban declared:



It is my expert opinion that one of ordinary skill in the art would recognize that JP8-35530 does not show that a flange portion of the union hole is formed by processing the sprue after the casting....

In additional, Appellants incorporate by reference the arguments presented above as it relates to the many other features of the claimed invention; that is, the applied references, either alone or in combination, do not show or one of skill would not be motivated to combine the references to show, e.g.,:

1. a sprue formed at the bottom portion of said cylinder of the caliper body for molding the caliper body with a base material, wherein the caliper body is molded with a cavity disposed with a union hole formed from the sprue;
2. the ratio of volume of the central chamber to that of the reaction chamber is in the range of 0.6 to 1.25, and
3. the ratio of volume of the central chamber to that of the action chamber is in the range of 0.7 to 1.35.

Additionally, as noted above, the declaration of Mr. Ban was not given proper deference in accordance with MPEP 716.01(c) III, *In re Beattie*, 974 F.2d 1309, 24 USPQ2d 1040 (Fed. Cir. 1992)).

Claims 26 and 27

Claims 26 and 27 each recite, with different dependencies,

....wherein said sprue is processed to form said union hole which is formed at the bottom portion of said cylinder.

As discussed in great detail above, the sprue JP-835530 is not used to form the union hole. The sprue and the union hole are completely two different features. As previously discussed, in order to prevent the hole 5 (in JP-835530 ) from being closed, the molten metal must be provided from the B-direction at a place

other than the hole 5. It would then be impossible for the hole to be used as a sprue.

***REJECTION UNDER 35 U.S.C. 103(a)***

***CLAIMS 18 AND 20-22***

***Claims 18 and 20-22***

The Examiner argues that JP-835530 in view of Ogino, JP-1146718 and WIPO 98/27353 show all of the features of claims 18 and 20-22. This is not accurate.

The WIPO reference discloses the use of a core, but there is no suggestion that a base material is injected in symmetry about the core. This reference only discloses that core is provided near the opening 17 of the caliper bridge 2, which ensures that the core is in the correct position for the casting operation. (See related USPN 6,298,954 at col. 4, lines 14-16.)


The WIPO reference discloses that the core is in the correct position for casting operations, which is not the same or similar to that of the symmetrical injection about the core, as claimed.

The Examiner still fails to consider all of the features of claim 22.

## CONCLUSION

In summary, the references applied by the Examiner, alone or in any combination, fail to teach or suggest the features of the claimed inventions. Therefore, the references do not provide evidence that would support a conclusion of obviousness under 35 U.S.C. §103(a). Appellants thus respectfully submit that the rejections of claims 6-11, 13-16 and 18-27 are in error and that reversal is warranted in this case.

Respectfully submitted,



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## CLAIMS APPENDIX

A copy of the claims involved in the appeal is provided below.

6. A caliper body of a vehicular disc brake to be made by a casting method, said vehicular disc brake having a pair of frictional pads disposed opposite to each other with a disc rotor held therebetween, said caliper body including a cylinder disposed on one side of the disc rotor, a reaction pawl disposed on the other side of the disc rotor, and a bridge for coupling said cylinder and said reaction pawl at the outer peripheral side of the disc rotor, said caliper body comprising:

a sprue which is formed at the bottom portion of said cylinder of the caliper body for molding the caliper body with a base material, wherein the caliper body is molded with a cavity disposed with a union hole formed from the sprue, while the side of molding said bottom portion of said cylinder is disposed in a vertically upper part of said cavity and also the side of molding said reaction pawl is disposed in a vertically lower part of said cavity,

wherein a one side of providing said cylinder is made an action chamber; an other side of molding said reaction pawl and said bridge is made a reaction chamber; and a thick-walled connection between said cylinder and said bridge is made a central chamber, and

the ratio of volume of the central chamber to that of the reaction chamber is in the range of 0.6 to 1.25, and

the ratio of volume of the central chamber to that of the action chamber is in the range of 0.7 to 1.35.

7. The caliper body of the vehicular disc brake as claimed in claim 6, wherein after casting but before being subjected to a cutting process; the ratio of volume of the central chamber to that of the reaction chamber is in the range of 0.6 to 1.25; and

the ratio of volume of the central chamber to that of the action chamber is in the range of 0.7 to 1.35.

8. The caliper body of the vehicular disc brake as claimed in claim 6, wherein after casting and after being subjected to a cutting process; the ratio of volume of the central chamber to that of the reaction chamber is in the range of 0.6 to 1.25; and the ratio of volume of the central chamber to that of the action chamber is in the range of 0.7 to 1.35.

9. The caliper body of the vehicular disc brake as claimed in claim 6, wherein said cylinder is singly disposed in the a central portion of said one side of the disc rotor.

10. The caliper body of the vehicular disc brake as claimed in claim 7, wherein said cylinder is singly disposed in the a central portion of said one side of the disc rotor.

11. The caliper body of the vehicular disc brake as claimed in claim 8, wherein said cylinder is singly disposed in the central portion of said one side of the disc rotor.

13. The caliper body of the vehicular disc brake as claimed in claim 6, wherein said base material is aluminum or aluminum alloy.

14. The caliper body of a vehicular disc brake as claimed 6, wherein said casting method is a gravity casting method.

15. A caliper body of a vehicular disc brake to be made by a casting method, the caliper body being used for the vehicular disc brake, said caliper body comprising a pair of frictional pads disposed opposite to each other with a disc rotor held therebetween, the caliper body having a cylinder disposed on one side of the disc rotor, a reaction pawl disposed on the other side of the disc rotor,

and a bridge for coupling said cylinder and said reaction pawl on the outer peripheral side of the disc rotor, wherein the caliper body is cast by a cavity with the side of molding the bottom portion of said cylinder disposed in the upper part of and in the vertical direction of said cavity and with the side of molding said reaction pawl disposed in the lower part of and in the vertical direction thereof, a sprue formed at the bottom portion,

wherein a one side of providing said cylinder is made an action chamber; an other side of molding said reaction pawl and said bridge is made a reaction chamber; and a thick-walled connection between said cylinder and said bridge is made a central chamber, and

the ratio of volume of the central chamber to that of the reaction chamber is in the range of 0.6 to 1.25, and

the ratio of volume of the central chamber to that of the action chamber is in the range of 0.7 to 1.35.

16. The caliper body of a vehicular disc brake as claimed 15, wherein said casting method is a gravity casting method.

18. The caliper body of the vehicular disc brake as claimed in claim 6, wherein the base material is injected in symmetry about an insert core.

19. A caliper body of a vehicular disc brake to be made by a casting method, said vehicular disc brake having a pair of frictional pads disposed opposite to each other with a disc rotor held therebetween, said caliper body including a cylinder disposed on one side of the disc rotor, a reaction pawl disposed on the other side of the disc rotor, and a bridge for coupling said cylinder and said reaction pawl at the outer peripheral side of the disc rotor, said caliper body comprising:

a sprue formed at the bottom portion of said cylinder of the caliper body for molding the caliper body with a base material, wherein the caliper body is molded with a cavity disposed with a union hole formed from the sprue, while the

side of molding said bottom portion of said cylinder is disposed in a vertically upper part of said cavity and also the side of molding said reaction pawl is disposed in a vertically lower part of said cavity,

wherein a flange portion of the union hole is formed by processing the sprue after the casting,

wherein a one side of providing said cylinder is made an action chamber; an other side of molding said reaction pawl and said bridge is made a reaction chamber; and a thick-walled connection between said cylinder and said bridge is made a central chamber, and

the ratio of volume of the central chamber to that of the reaction chamber is in the range of 0.6 to 1.25, and

the ratio of volume of the central chamber to that of the action chamber is in the range of 0.7 to 1.35.

20. The caliper body of the vehicular disc brake as claimed in claim 7, further comprising a core within the cavity thereby causing the base material injected from the sprue to run toward the bridge thereby ensuring that the base material runs round toward said reaction pawl.

21. The caliper body of the vehicular disc brake as claimed in claim 20, wherein the thick-walled connection is made with the base material between said cylinder and said bridge.

22. The caliper body of the vehicular disc brake as claimed in claim 21, wherein:

solidification of the base material starts from said reaction pawl; and

the solidification of the base material progresses toward said thick-walled portion where the solidification is slower such that even though the volume of said reaction pawl is reduced because of the solidification, a supply of the base material from said thick-walled portion continues due to a supply effect based on the ratio of volume of the central chamber, whereby any sink mark is prevented

from being produced in the reaction pawl.

23. The caliper body of the vehicular disc brake as claimed in claim 6, wherein the base material is injected through the cavity so as to reach into portions of said cavity to be form said reaction pawl and said cylinder.

24. The caliper body of the vehicular disc brake as claimed in claim 15, wherein a base material is injected through a cavity so as to reach into portions of said cavity to form said reaction pawl and said cylinder.

25. The caliper body of the vehicular disc brake as claimed in claim 19, wherein the base material is injected through a cavity so as to reach into portions of said cavity to form said reaction pawl and said cylinder.

26. The caliper body of the vehicular disc brake as claimed in claim 6, wherein said sprue is processed to form [[a]] said union hole which is formed at the bottom portion of said cylinder.

27. The caliper body of the vehicular disc brake as claimed in claim 15, wherein said sprue is processed to form a union hole which is formed at the bottom portion of said cylinder.

28. The caliper body of the vehicular disc brake as claimed in claim 6, wherein a supply of a molten metal to a reaction portion allows the molten metal to be in a central portion where the solidification is slow due to the supply effect based on the ratio of volume of the central chamber thereto.



### **EVIDENCE APPENDIX**

This section lists evidence submitted pursuant to 37 C.F.R. §§1.130, 1.131, or 1.132, or any other evidence entered by the Examiner and relied upon by Appellant in this appeal, and provides for each piece of evidence a brief statement setting forth where in the record that evidence was entered by the Examiner. Copies of each piece of evidence are provided as required by 35 U.S.C. §41.37(c)(ix).

<b>NO.</b>	<b>EVIDENCE</b>	<b>BRIEF STATEMENT SETTING FORTH WHERE IN THE RECORD THE EVIDENCE WAS ENTERED BY THE EXAMINER</b>
<b>1</b>	<b>DECLARATION UNDER 37 CFR 1.132 of Keisuke Ban</b>	<b>Amendment dated May 26, 2004 in response to Office Action dated March 2, 2004</b>

**RELATED PROCEEDINGS APPENDIX**

Pursuant to 35 U.S.C. §41.37(c)(x), copies of the following decisions rendered by a court of the Board in any proceeding identified above under 35 U.S.C. §41.37(c)(1)(ii) are enclosed herewith.

NO.	TYPE OF PROCEEDING	REFERENCE NO.	DATE
1	N/A	N/A	N/A

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